

Genetic Detection of Predation on Larval Delta Smelt

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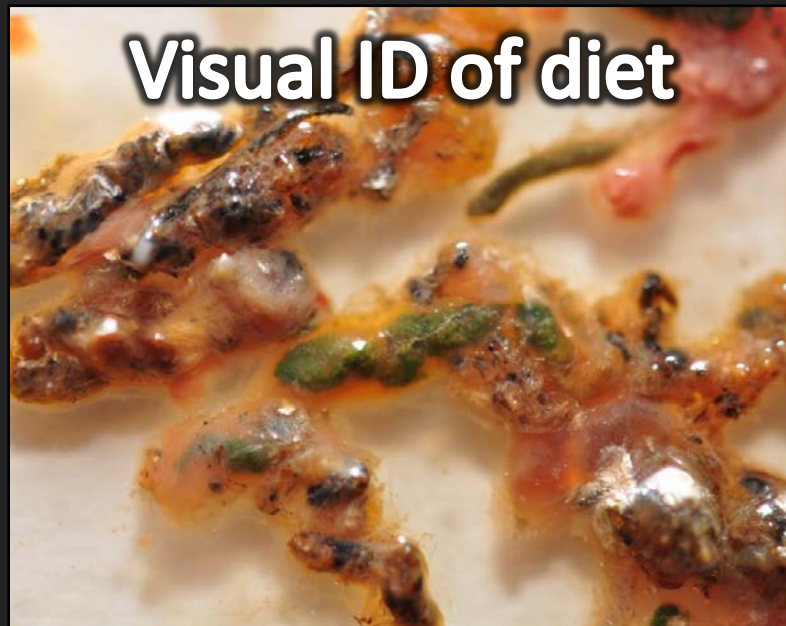
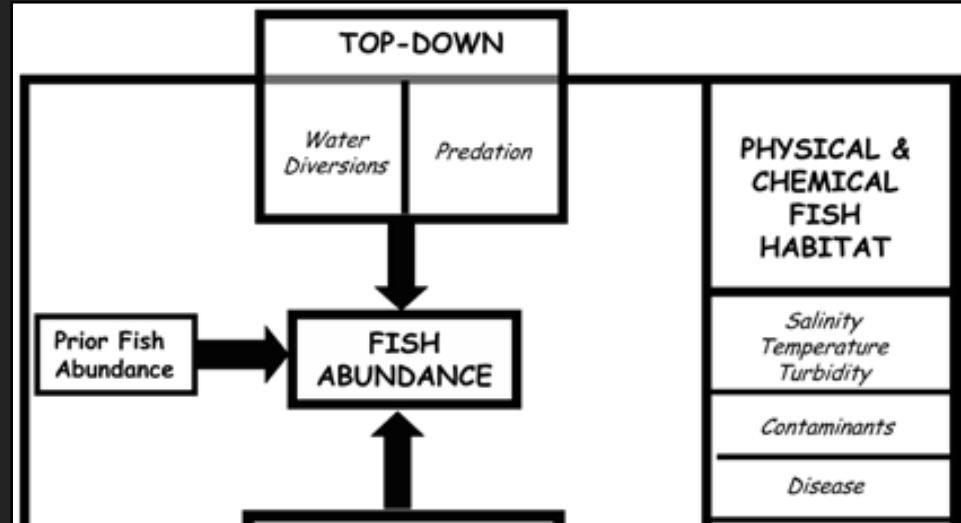
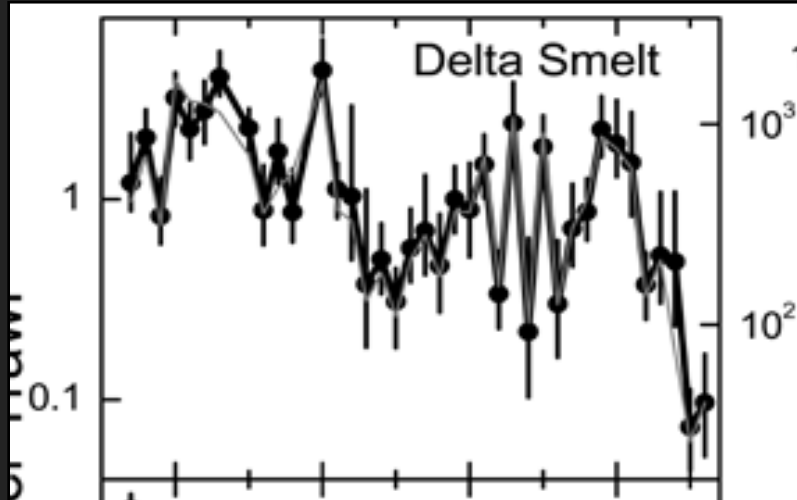
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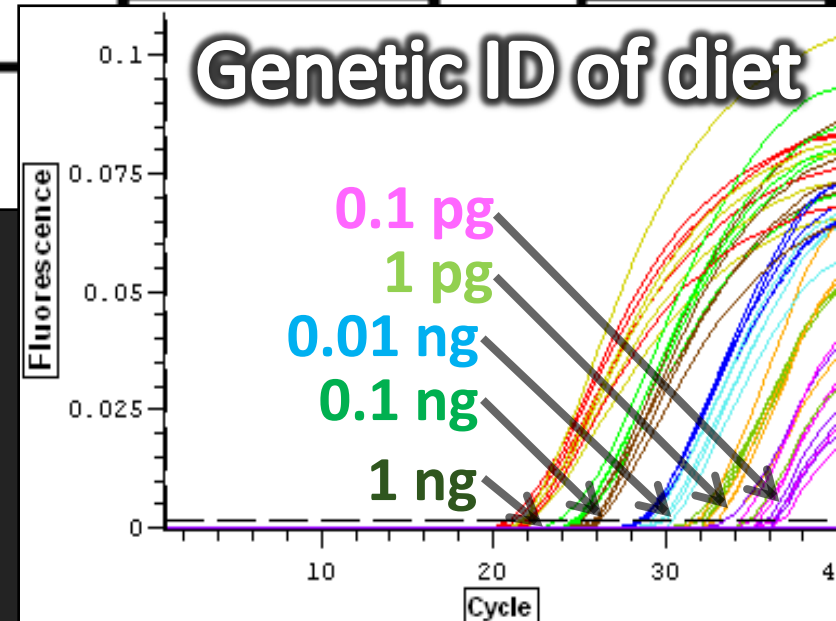
Acknowledgements



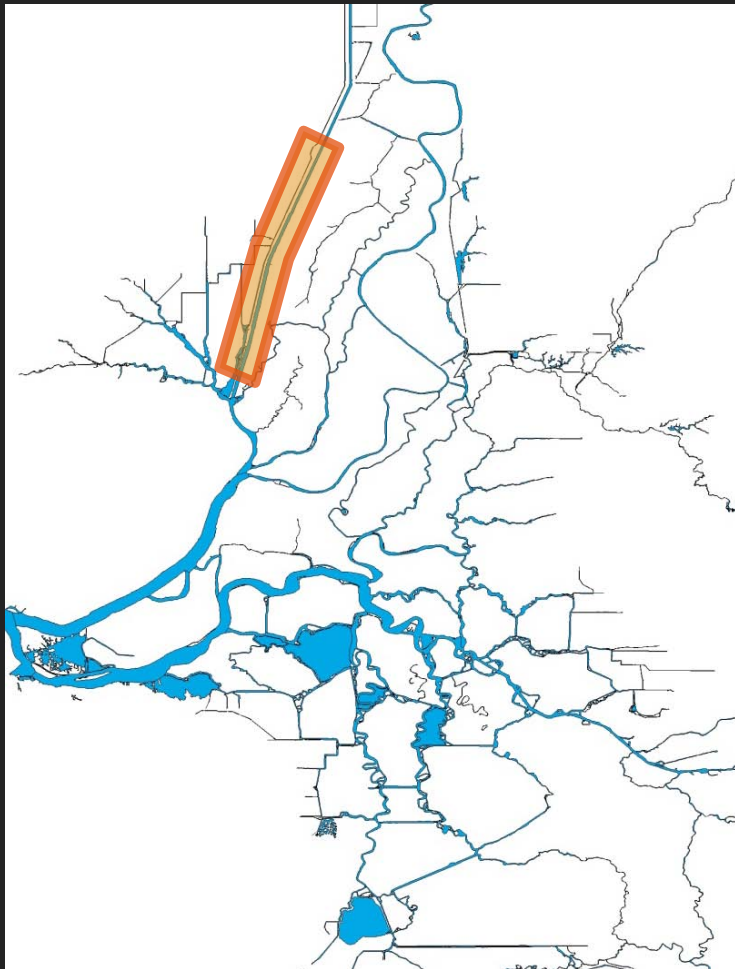
The Problem



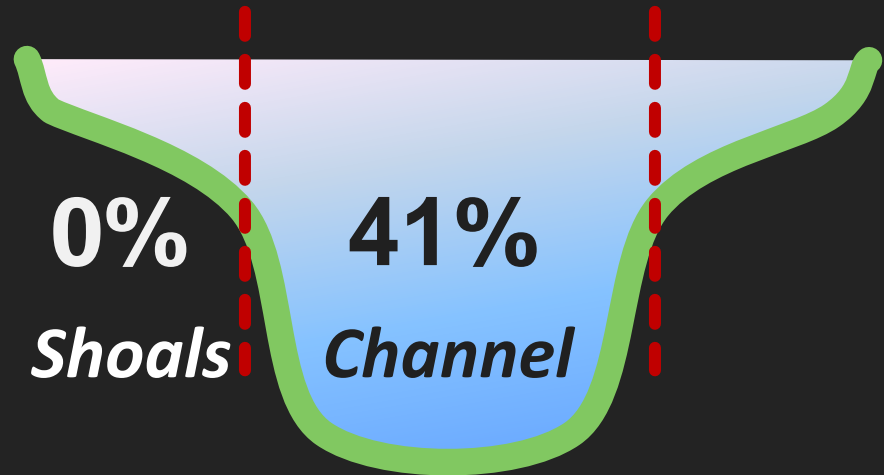
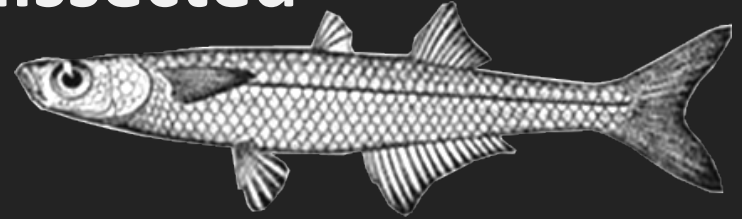
VS



Pilot Study – April 2010



658 dissected



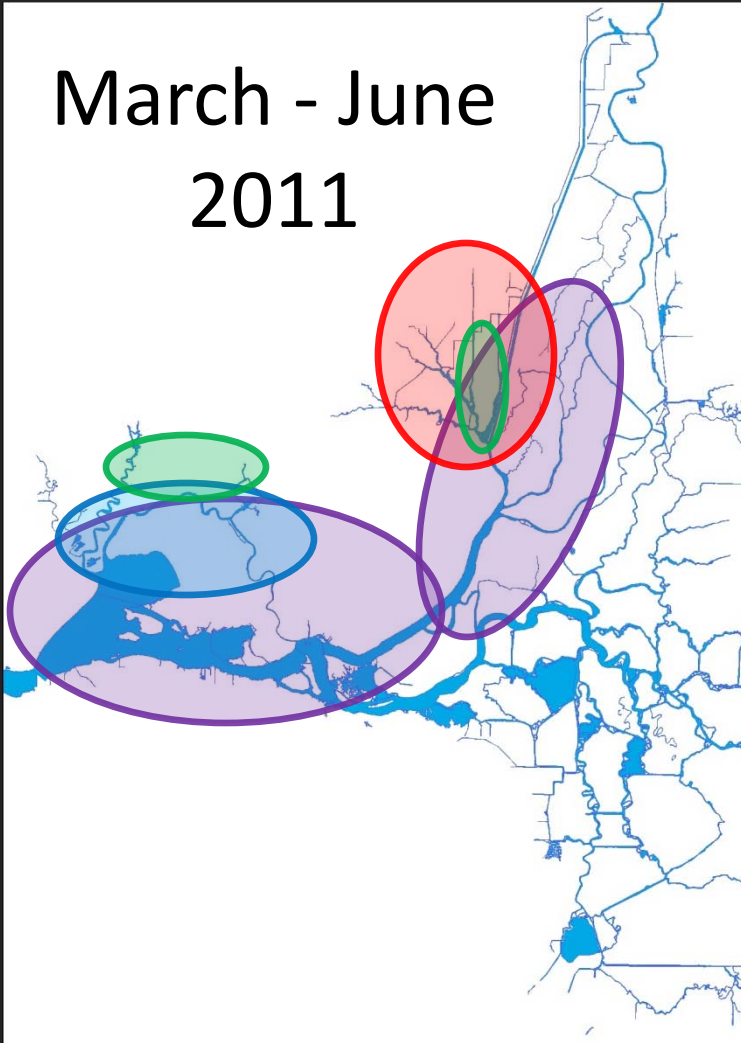
Percent positive for smelt

Revised Questions

- How widespread is larval smelt predation across the north delta?
- What differences exist between different habitat types?
- Is incidence of predation correlated with any water quality?

Approach

March - June
2011



Boat Electrofishing

Beach Seines

Spring Kodiak Trawls

Otter Trawls



Results



Results

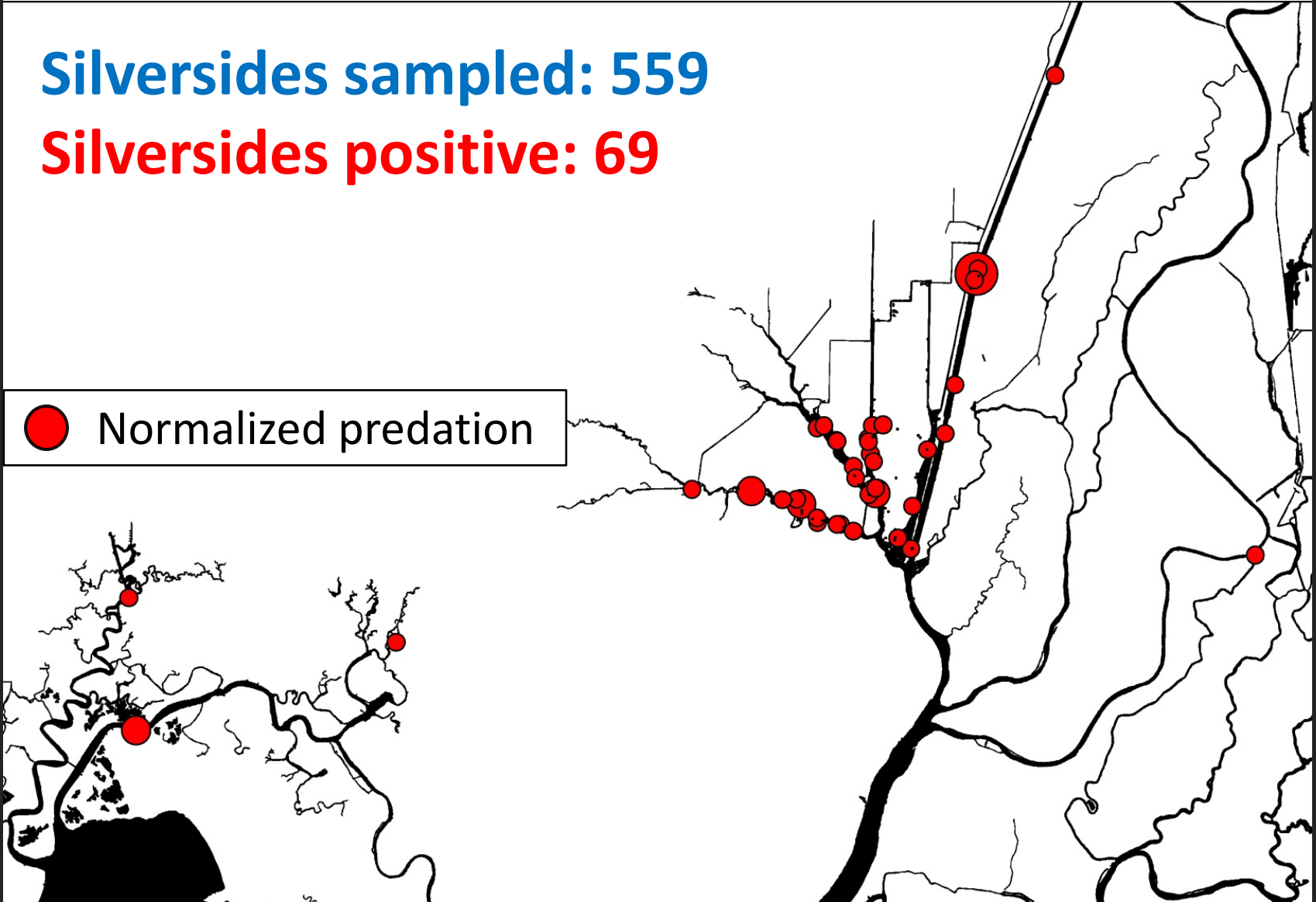
Species	Tested for smelt DNA	Positive for smelt DNA
Striped bass	73	1
Pikeminnow	44	2
Sunfish	38	1
Largemouth bass	30	2
Gobies	25	1
Threadfin shad	21	1
Chinook salmon	16	1
Golden shiner	10	1
Tule perch	6	1
Exopalaemon shrimp	4	1
Three-spine stickleback	1	1

Results: Mississippi Silversides

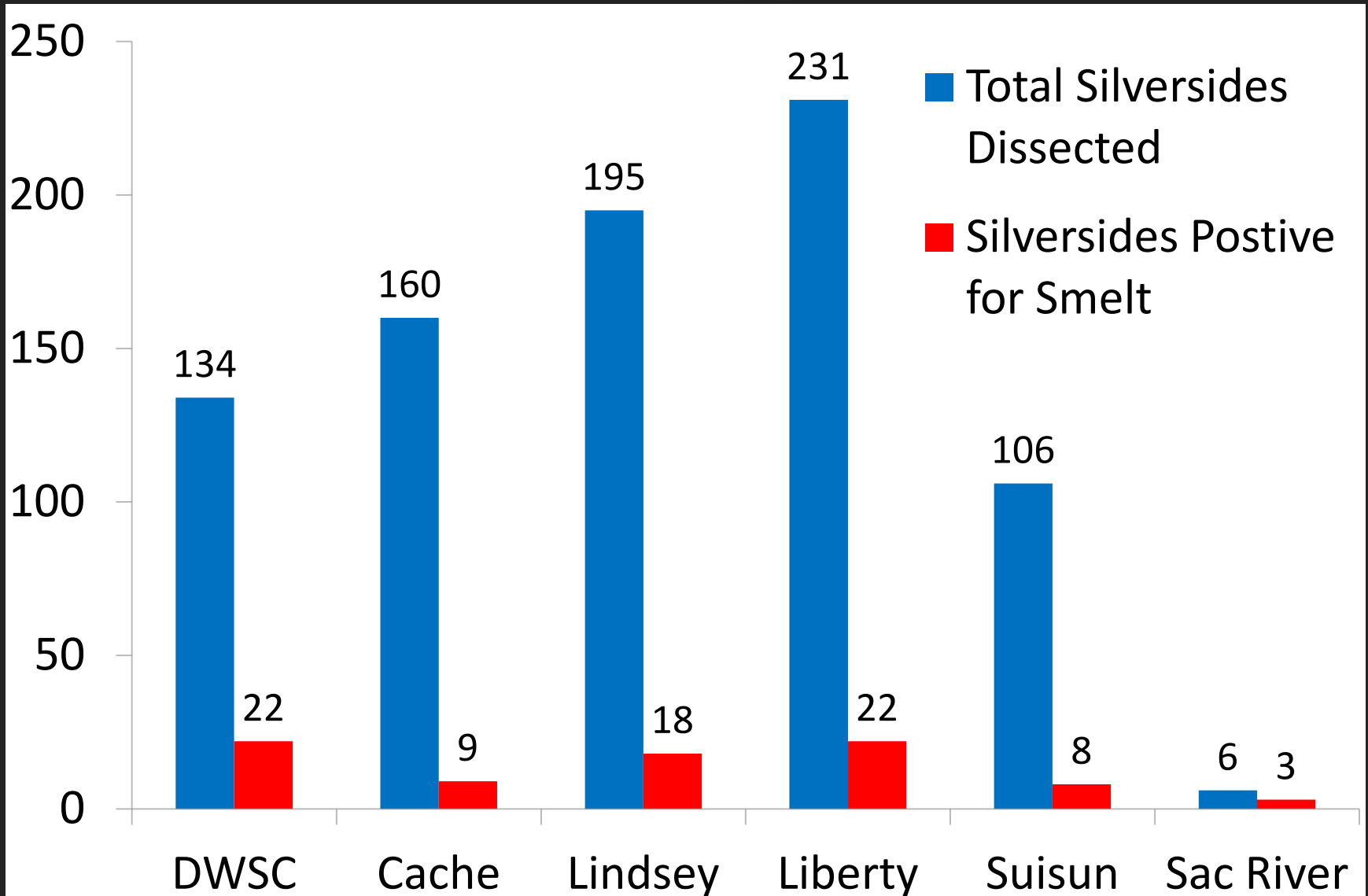
Silversides sampled: 559

Silversides positive: 69

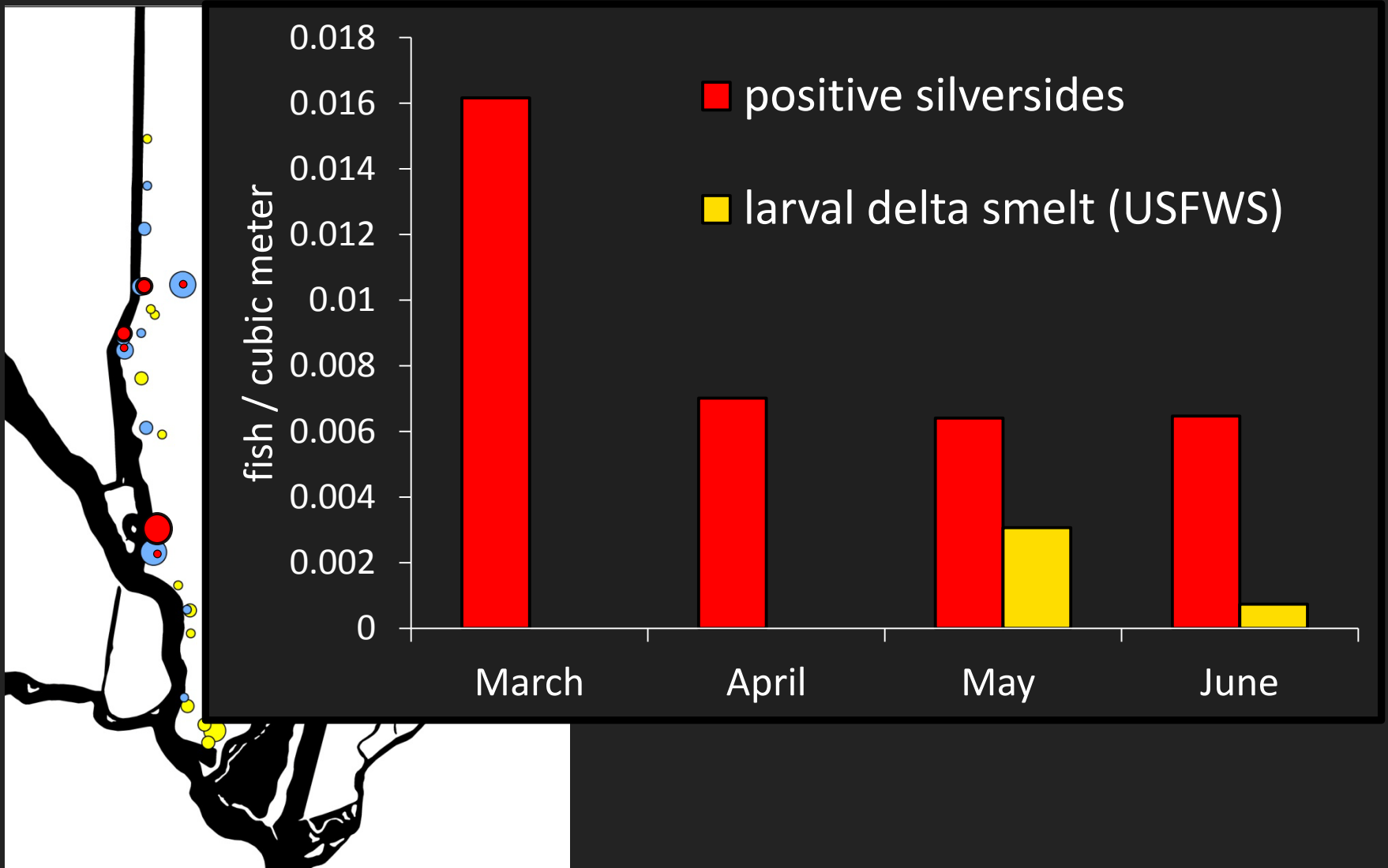
● Normalized predation



Results: Mississippi Silversides

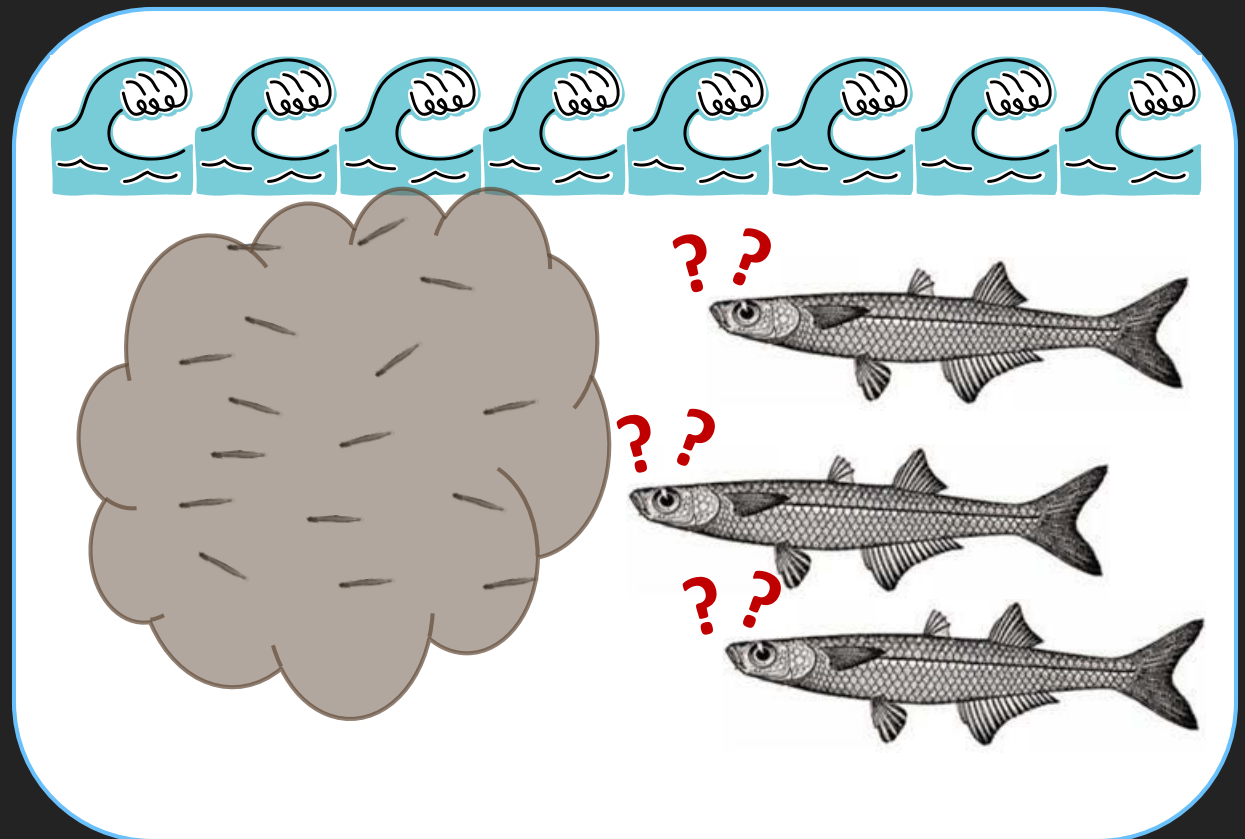


Liberty Island



Environmental Correlates

- Temp
- Turbidity
- Salinity
- DO
- pH



Conclusions

Anything will eat a larval smelt...

...and

...and

de

Our

keys aren't

ve!

al smelt

rarely'



Next Steps

- Refining abundance estimates of larval smelt and silversides
- Exopalaemon shrimp?!?
- Predation by striped bass, smallmouth bass, and pikeminnow in the north Delta

Bioenergetics of a Silverside

Silverside daily
growth model



Delta specific
growth rates



Daily energy
needed for
median growth



12% ?



“Max” number of
larval fish
consumed per day



Energy per larval
fish